Estimating the Empirical Likelihood of Becoming a "Public Charge"

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Synopsis

The authors conduct an *ex ante* policy evaluation of the Trump Administration's public charge rule using artificial intelligence to recreate immigration official decision-making. The analysis concludes that the number of immigrants who should be evaluated as likely to become a public charge under the rule is zero.

Context

In February 2020, the Department of Homeland Security (DHS) implemented a new regulation that primarily affected applicants for permanent residency (a "green card") who already live in the United States.[2] The new rule redefined the "public charge" inadmissibility grounds to apply to anyone found "more likely than not" (i.e. more than 50% likely) to receive certain public benefits for more than 12 months in aggregate within any 36-month period.[3] This superseded previous guidance for the public charge inadmissibility grounds which did not adopt a specific threshold for receipt of government benefits.[4]

The DHS public charge rule applied to applicants for permanent residency on the basis of family relationships and employment, not those applying on humanitarian grounds for permanent residency such as refugees and asylees.[5] The operative time period that the public charge rule considers is between the moment that an individual becomes a lawful permanent resident (i.e. receives their green card) and the moment they become a naturalized U.S. citizen.[6] The average

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[2] The DHS final rule, "Inadmissibility on Public Charge Grounds," was published in the Federal Register in August 2019, but was blocked by federal court injunctions until Feb. 2020, when it first took effect. A comparable State Department rule, "Visas: Ineligibility Based on Public Charge Grounds," would apply to applicants for permanent residency filing from abroad, but is currently enjoined (see *Make the Road New York v. Pompeo*).

[3] The statutory basis for the public charge rule is 8 U.S.C. 1182(a)(4): "Any alien who, in the opinion of the consular officer at the time of application for a visa, or in the opinion of the Attorney General [now the Secretary of Homeland Security] at the time of application for admission or adjustment of status, is **likely at any time to become a public charge** is inadmissible."

The new DHS regulation defines "public charge" in 8 CFR § 212.21(a): "Public charge means an alien who receives one or more public benefits, as defined in paragraph (b) of this section, for more than **12 months in the aggregate within any 36-month period** (such that, for instance, receipt of two benefits in one month counts as two months)."

The new regulation defines "likely at any time to become a public charge" in 8 CFR § 212.21(c): "Likely at any time to become a public charge means **more likely than not at any time in the future to become a public charge**, as defined in 212.21(a), based on the totality of the alien's circumstances."

[4] The previous criteria, which are back in effect as of this writing, are set out in the 1999 Interim Field Guidance from the Immigration and Naturalization Service, the forerunner to DHS (https://www.federalregister.gov/documents/1999/05/26/99-13202/field-guidance-on-deportability-and-inadmissibility-on-public-charge-grounds). In addition to not specifying a threshold for use of benefits to constitute a public charge, this guidance explicitly specifies that receipt of non-cash benefits (e.g. Medicaid, SNAP, housing vouchers, etc.) does not trigger inadmissibility grounds.

[5] See the USCIS summary page on the DHS public charge rule: https://www.uscis.gov/green-card/green-card-processes-and-procedures/public-charge

[6] 8 CFR § 212.21(a): "Public charge means an **alien** who receives one or more public benefits, as defined in paragraph (b) of this section, for more than 12 months in the aggregate within any 36-month period (such that, for instance, receipt of two benefits in one month counts as two months)."

length of time between these points is eight years;[7] however, the vast majority of relevant permanent residents are not eligible for any public benefits until five years after receiving their green card.[8] Thus, in effect, the typical length of time during which an individual could "become a public charge" is only 3 years.

The 2019 rule provided a framework for the immigration officer to judge the applicant's likelihood of becoming a public charge while a lawful permanent resident. The rule set out a "totality of the circumstances" test based on some 20 different qualitative factors, including the applicant's age, health, family status, financial status, and education.[9] Although the rule indicated how each factor contributes positively or negatively to their likelihood of receiving benefits, it did not specify an exact decision rule for how immigration officers should combine the factors to form a judgment. Our predictive analysis in the last section of this piece aims to provide a method for combining the factors in a manner consistent with the empirical evidence on benefit receipt among relevant green card holders.

In November 2020, the U.S. District Court for the Northern District of Illinois had vacated the public charge rule on the grounds that it violated the Administrative Procedure Act and exceeded DHS's Congressional authority, but this decision was stayed by the U.S. Court of Appeals for the Seventh Circuit while the Trump administration asked the Supreme Court to review the decision.

On March 9, 2021, the Biden administration filed motions asking the Supreme Court to dismiss the appeal and announced that the government would no longer defend the rule in court. The motions were granted, leaving the Seventh Circuit's order in place. This effectively vacated the rule, ending its application. The Attorneys General of several states attempted to intervene to revive the rule, but the U.S. Supreme Court declined to do so in April 2021. Litigation is still pending in several lower courts.

Therefore, an applicant's likelihood of receiving public benefits while a U.S. citizen presumably cannot be part of the public charge determination, because at that point the applicant will no longer be an "alien."

USCIS supported this interpretation in its own Policy Manual, which stated: "U.S. citizens are not subject to the public charge ground of inadmissibility, and therefore, the term of the public charge bond no longer applies after the alien has become a U.S. citizen."

[7] The median number of years of residence for newly naturalized citizens [is] eight years. (Migration Policy Institute. "Naturalization Trends in the United States." July 11, 2019. https://www.migrationpolicy.org/article/naturalization-trends-united-states).

[8] Congressional Research Service. "Noncitizen Eligibility for Federal Public Assistance: Policy Overview." Dec. 12, 2016. Accessed at: https://fas.org/sgp/crs/misc/RL33809.pdf

[9] USCIS Policy Manual, Part G - Public Charge Ground of Inadmissibility. Appendix: Totality of the Circumstances Framework: https://www.uscis.gov/sites/default/files/document/policy-manual-updates/Appendix-TotalityoftheCircumstancesFramework.pdf

In the meantime, the Biden administration reinstated the 1999 Interim Field Guidance that previously defined the public charge rule on March 9, 2021.[10] The Guidance does not specify a threshold for use of benefits to constitute a public charge, and explicitly specifies that receipt of non-cash benefits (e.g. Medicaid, SNAP, housing vouchers, etc.) does not trigger inadmissibility grounds.

On March 15, 2021, U.S. Citizenship and Immigration Services (USCIS) published a final rule that removed its 2019 public charge regulations from the Federal Register; discontinued the Form I-944 Declaration of Self-Sufficiency and other forms used to implement the rule; and called for the revision of the Form I-485 Application to Register Permanent Residence or Adjust Status and forms related to Affidavits of Support.

Even though the 2019 rule is no longer applicable, it is worth understanding the extent to which the threshold it set is consistent with actual benefit receipt of lawful permanent residents. Similar rules may be proposed in the future, and even in the interim the analysis presented here may be useful for determining the prevalence (or lack thereof) of individuals who are inadmissible on the grounds adopted by the Biden administration.

Data

We use data from the Survey of Income and Program Participation (SIPP) covering 2008-2013.[11] The SIPP is a nationally-representative longitudinal survey of households conducted by the U.S. Census Bureau designed specifically to measure participation in government safety net programs. Each household is interviewed every four months about their members' monthly income, employment, and receipt of government benefits since the last interview. The survey is designed to be nationally representative, and we ensure that our analysis is similarly representative by using the provided sampling weights.

We include in our sample citizens and lawful permanent residents (LPR), and exclude all other individuals. Respondents are asked about their citizenship status monthly, and non-citizen respondents are asked in their second interview whether they are a permanent resident and, if so, when they received this status. We code any non-citizens who report permanent resident status as an LPR until they report themselves as a citizen.[12]

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[10] Field Guidance on Deportability and Inadmissibility on Public Charge Grounds, 64 Fed. Reg. 28698, March 26,1999, available at: https://www.federalregister.gov/documents/1999/05/26/99-13202/field-guidance-on-deportability-and-inadmissibility-on-public-charge-grounds.

[11] We use the 2008 SIPP data because the 2008 questionnaire, unlike the more recent 2014 data, distinguishes between lawful permanent residents and other non-citizens. We believe the patterns from analyzing the 2008 survey are still valid since there have been no major relevant changes in the law since then. Additionally, the 2008–2013 SIPP data come from a period when benefit receipt was historically high in the aftermath of the Great Recession, so our results may be an "upper bound" for benefit receipt on average.

[12] Some non-citizen individuals may not have been permanent residents as of their second interview, but became permanent residents later. These individuals are excluded throughout since we are unable to

We aggregate each respondent's monthly benefits received across eight different government programs: SNAP (food stamps), Federal Supplemental Security Income (FSSI), State Supplemental Security Income (SSSI), public assistance payments (e.g. AFDC or TANF), Medicaid, general assistance, government subsidized rent, or the Section 8 housing program. For each month, we calculate the total number of benefit-months each respondent received between zero and eight (such that the receipt of two benefits in one month constitutes two benefit-months).[13] The 2019 public charge rule applied to respondents reporting receipt of more than 12 benefit-months over a 36-month period.

The SIPP also includes demographic information about respondents, including age, gender, race, education level, and disability status. Race is divided into categories for white alone, Black alone, Asian alone, and all others. We combine education levels into five categories: less than high school, high school graduate, some college, college graduate, and advanced degree. Disability status refers to whether or not an individual has a "physical, mental, or other health condition that limits the kind or amount of work [one] can do at a job or business".[14]

The table below provides a summary of some of the demographic characteristics of our sample.

Table 1: Summary statistics

	(1) Citizens		(2) LPRs	
	Mean	SD	Mean	SD
Female	0.52	0.50	0.55	0.50
Age	38.4	23.5	43.4	15.1
Non-white	0.30	0.46	0.76	0.43
Non-college	0.54	0.50	0.58	0.49
Household size	3.4	1.7	3.9	1.9
Employed	0.45	0.50	0.62	0.49
Annualized personal income	$24,681	$39,838	$24,235	$41,112
Annualized family income	$68,507	$69,330	$58,773	$64,896

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distinguish their period of permanent residence from the period in which they were not yet a permanent resident.

[13] 84 FR 41292

[14] See the SIPP survey definition here: https://data.nber.org/sipp/2008/l08puw1d.txt

| Number of observations | 4,999,996 | 126,311 |

Notes: Table shows means and standard deviations (SD) of demographic characteristics among citizens and LPRs in the 2008 SIPP sample. Non-college includes only individuals with a high school degree or less. Household size is measured as the number of persons. Both annualized income variables are defined as monthly income times 12, measured in nominal dollars in the year of response.

Results

To understand whether potential applicants could be denied lawful permanent residency status on the basis of the 2019 public charge rule inadmissibility grounds, we use the SIPP data described above to understand the extent to which lawful permanent residents use public benefits. If we do not find evidence that lawful permanent residents are more likely than not to become a public charge, then it would be difficult to deny an applicant permanent residency on such a basis.

We start with descriptive evidence, examining the likelihood of receiving any benefits in a given month. We show first that LPRs are only 16% likely to do so, which is lower than the likelihood of benefit use for citizens. We then show how the dynamics of benefit use for lawful permanent residents evolves over time. Although there is a small increase in benefit receipt among this group about five years after obtaining a green card (which is when many LPRs become eligible to receive benefits), their rate of benefit receipt remains lower than citizens. Lastly, we show that LPRs as a whole group are much less than 50% likely to receive at least 12 benefit-months during a 36-month period.

Even though our descriptive exercises show that the average LPR is unlikely to meet the DHS definition of a public charge, one could argue that some subset may still meet this threshold. So, we turn to a predictive exercise to estimate how the probability of becoming a public charge varies with individual characteristics, producing predictions about the likelihood of becoming a public charge for every individual in our dataset. We find that no LPR in our sample has a likelihood of becoming a public charge above the regulatory threshold of 50%, and the vast majority are far below this threshold and close to 0%.

Put simply, applying the 2019 public charge regulation with an accurate understanding of the reality of public benefits use by green card holders would result in no applicants being denied admission. However, immigrant visa denials on public charge grounds increased by a factor of 10-20 in recent years as the U.S. State Department put the 2019 public charge rule into effect.[15]

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[15] In advance of the 2019 public charge rule being finalized, the U.S. State Department updated their Foreign Affairs Manual to reflect the new guidance on visa issuance for consular officers in January 2018. Immigrant visa denials on public charge grounds subsequently skyrocketed from 1,076 in FY 2016 to 13,450 in FY 2018 and 20,941 in FY 2019.

Bureau of Consular Affairs. "Report of the Visa Office 2019, Table XX". https://travel.state.gov/content/dam/visas/Statistics/AnnualReports/FY2019AnnualReport/FY19AnnualReport-TableXX.pdf

Descriptive Evidence

As a first pass, in Figure 1, we show each group's probability of receiving any relevant government benefits. Permanent residents actually have a lower likelihood of using benefits in a given month compared to citizens: the probability of an LPR using any one of the eight program benefits mentioned previously is 0.16 to 0.17 for citizens.[16] Importantly, the average probability of benefit receipt in a month for includes *all* LPRs, including those exempt from the public charge rule on a humanitarian basis.

Figure 1: Probability of benefit usage in a month
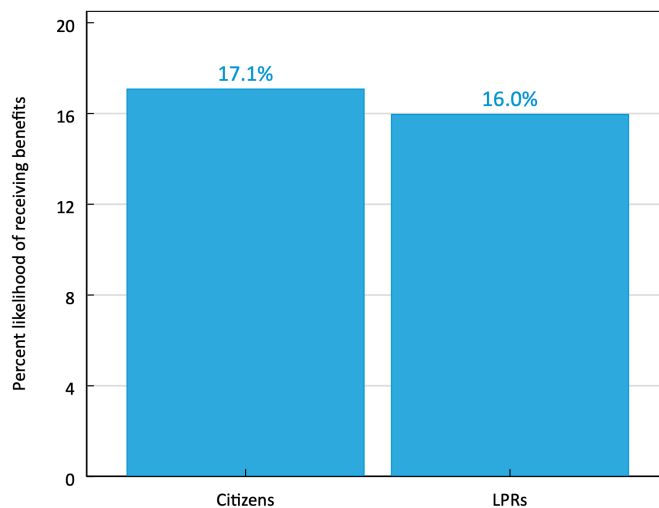
Notes: Figure shows the average probability of receiving at least one of eight different types of government benefits in a month for citizens and LPRs in the 2008 SIPP sample. Individuals who are neither citizens nor LPRs are excluded.

Second, we plot how the probability of receiving benefits evolves over time. In Figure 2, we show the average probability that an LPR (blue line) receive benefits over the years since obtaining a green card (x-axis). For comparison, we also plot average benefit receipt for citizens (orange

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Bureau of Consular Affairs. "Report of the Visa Office 2018, Table XX". https://travel.state.gov/content/dam/visas/Statistics/AnnualReports/FY2018AnnualReport/FY18AnnualReport%20%20-%20TableXX.pdf

Bureau of Consular Affairs. "Report of the Visa Office 2016, Table XX". https://travel.state.gov/content/dam/visas/Statistics/AnnualReports/FY2016AnnualReport/FY16AnnualReport-TableXX.pdf

[16] Since the "Descriptive Evidence" section is meant to describe the patterns in the data, we use the probability of using *any* benefit in a given month as an outcome variable. DHS, however, uses "Totality of the Circumstances Framework" to define an applicant's future likelihood of receiving one or more public benefits above the threshold (such that, for instance, receipt of two benefits in 1 month counts as 2 months). Even according to this DHS definition of benefit usage, we find that the probability of usage for lawful permanent residents in a given month is 0.19, slightly higher than the 0.16 probability above but considerably lower than the 50% threshold. We use the DHS framework in the "Prediction" section below for modeling the likelihood of becoming a public charge.

dashed line). While there is a small increase in benefit usage among LPRs in the later years, they consistently receive benefits at the same or lower rates than citizens.

Figure 2: Average benefit receipt over time
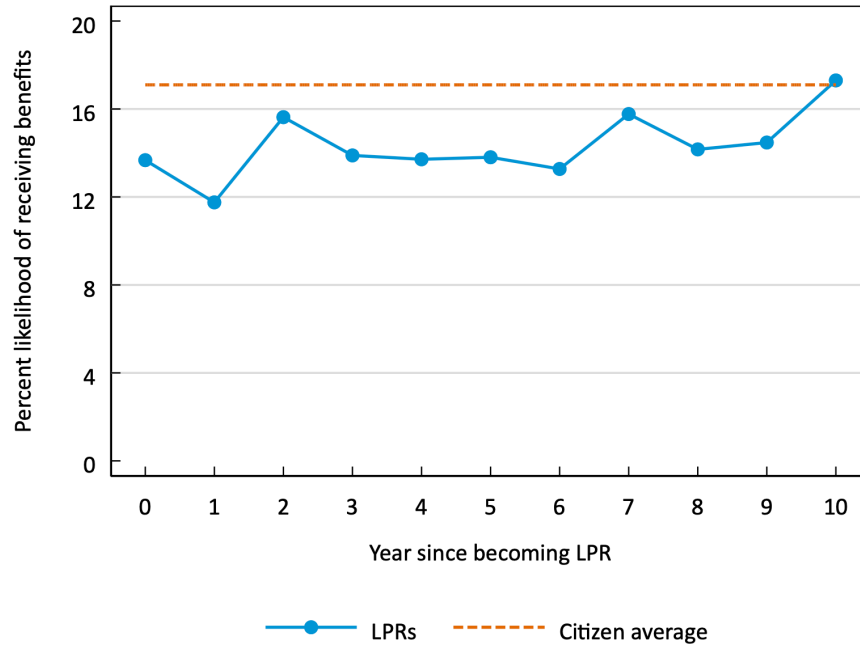
Notes: The solid line shows the average probability of receiving at least one type of government benefits in a month for LPRs in the 2008 SIPP sample, broken down by year since becoming an LPR. Individuals with more than 10 years since becoming an LPR are included in the "10" category. The dashed line shows the average probability for citizens. Individuals who are neither citizens nor LPRs are excluded.

To test whether these differences in benefit usage are driven by differences in citizens' and non-citizens' characteristics, we estimate the average probability of benefit receipt controlling for an individual's age, education level, disability status, gender, family income, and race. The results are shown in the Figure 3 below and confirm that LPRs are always less or equally likely to use benefits than are citizens.

Figure 3: Benefit receipt over time adjusted for characteristics
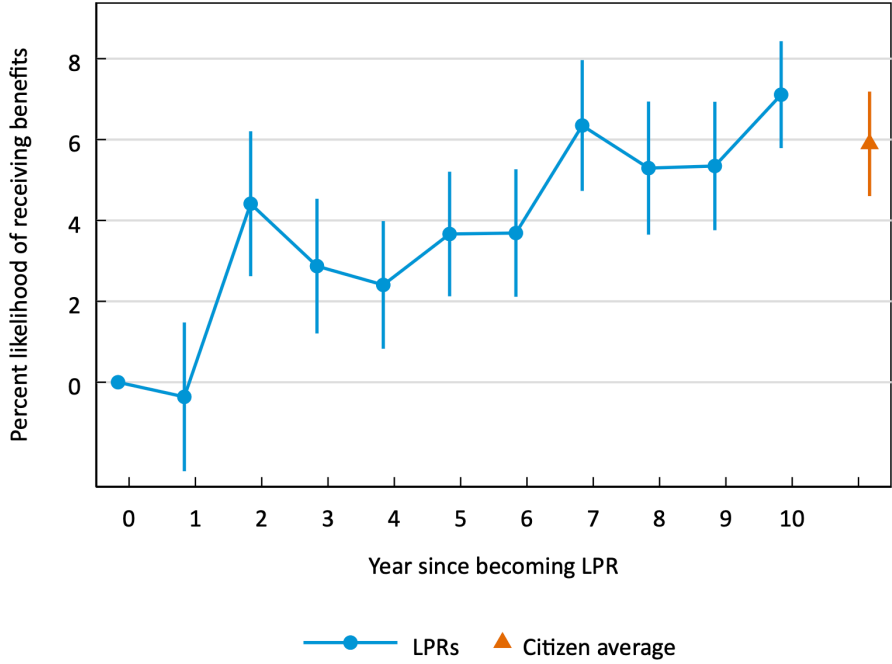
Notes: This figure shows patterns of benefit receipt conditional on demographic characteristics. We regress an indicator for receiving at least one type of government benefits on dummies for citizenship status (interacted with year since becoming an LPR for LPRs) as well as controls for age, education level, disability status, gender, family income, and race. The circles show the coefficients for LPRs, and the triangle shows the coefficient for citizens. Individuals with more than 10 years since becoming an LPR are included in the "10" category. The coefficients represent the excess probability of receiving benefits compared to a demographically-identical LPR in year 0. Individuals who are neither citizens nor LPRs are excluded.

Third, we directly examine the likelihood of citizens and LPRs meeting the threshold set in the public charge rule. For each 36-month period that we observe an individual in the dataset, we mark them as meeting the threshold if they receive at least 12 benefit-months of government benefits. Then we average across all 36-month periods that we observe citizens and LPRs to estimate the average probability of meeting the public charge rule threshold for each group, which we plot in Figure 4. Although there are small differences between citizens and LPRs, both groups have average probabilities well below the 50% likelihood standard. An important implication of this is that the *average* LPR cannot be judged to be "more likely than not" to be a public charge, given that only 19.2% of LPRs exceed 12 benefit-months over a 36-month period.

Figure 4: Average likelihood of meeting public charge threshold
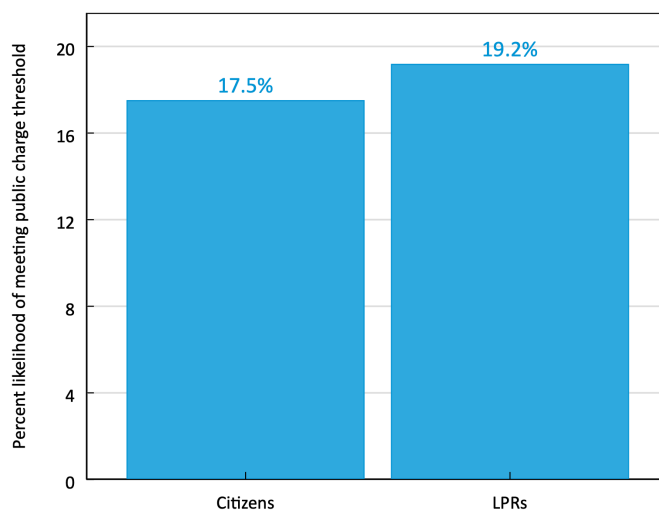
Notes: This figure shows the average likelihood of meeting the DHS definition of a public charge for citizens and LPRs. For each individual and month, we assign them a 1 if they have received at least 12 benefit-months of government benefits within the preceding 36-month period and a 0 if they have received less than 12 benefit-months. The blue bars show the average of this variable for each group. Individual observations without 36 prior months in sample are excluded since they cannot be categorized.

Although the average likelihood is well below 50%, there are three important caveats worth noting. First, this sample includes refugee and asylee LPRs, who are both not subject to the public charge rule and are eligible to collect benefits through their residence. Therefore, this should be viewed as an *overestimate* of the share of LPRs who may be denied admission under the public charge rule.

Second, this calculation is based on the *realized* rates of benefit receipt, which may not be the same as the *expected* rates of benefit receipt. The public charge rule is based on a determination of future likelihood, which would not account for factors such as a recession or a change in policy eligibility rules that affects the observed rates of benefit receipt. We address these caveats with our analysis in the next section, which estimates *expected, individual-level* likelihoods of meeting the benefit threshold for the group of LPRs that are all subject to the public charge rule.

Third, Figure 4 reports the *average* likelihood, but the public charge rule refers to an *individual's* likelihood. The likelihood of becoming a public charge may vary across individuals. Although the average LPR may be much less likely than 50%, this alone cannot rule out the possibility that a subset of individuals within the LPR population could be above 50%. We turn to this question by examining individual-level probabilities of becoming a public charge.

Predictions

To determine probability of an individual LPR being deemed a public charge, we consider the question that immigration officers must answer — how likely is it that a particular immigrant becomes a public charge in the future? This requires making a prediction on the basis of the applicant's characteristics, which we can simulate by applying machine learning tools to our

dataset. Our analysis estimates the probability of any individual LPR becoming a public charge based on the benefit receipt of LPRs in our dataset with similar characteristics, revealing which, if any, characteristics indicate a tendency to become a public charge in the future.[17]

Concretely, our method estimates an *individual-level* probability of becoming a public charge. Supposing that the LPR in question has a college degree, our method will use the observed benefit receipt patterns of other college-degree-holding LPRs to estimate how likely it is that the LPR in question meets the public charge threshold. For example, we might estimate that an individual LPR has a 5% probability of meeting the 12-benefit-months-out-of-36 threshold for becoming a public charge. This probability is estimated based on the benefit receipt patterns of similar LPRs in our SIPP sample.

To choose "similar" LPRs to estimate benefit receipt from, we examine LPRs who are similar with respect to the factors that immigration officers are directed to consider when carrying out the public charge rule. We use the following factors laid out by USCIS, which are observable and measurable in the sample:

Table 2: Factors from the 2019 public charge rule

Panel I: Binary factors		
Factor:	Positive value*	Negative value*
Age	Ages 18-61	Ages 17 or under, or 62 plus
Health	No condition that limits working	Has a health condition that limits working
Family income	Cumulative family income over preceding 12 months $\geq$ 125% of Federal poverty line	Cumulative family income over preceding 12 months < 125% of Federal poverty line
Family assets	*Either* family income $\geq$ 125% of poverty line *or* household net worth $\geq$ 5 x (diff. between family income and 125% of poverty line)	Family income < 125% of poverty line *and* household net worth < 5 x (diff. between family income and 125% of poverty line)
Employment	Is currently employed	Is not currently employed
Health insurance	Has private health insurance	Has public or no health insurance
Language	Household contains at least one proficient English speaker	Household contains no proficient English speakers
Personal income	Cumulative personal income over preceding 12 months $\geq$ 250% of poverty line	Cumulative personal income over preceding 12 months < 250% of poverty line
Household resources	Family income plus household net worth $\geq$ 250% of poverty line	Family income plus household net worth < 250% of poverty line

[17] In this exercise, we narrow our focus to the subset of permanent residents who would be subject to public charge rule, excluding any permanent resident who we observe receiving public benefits at any point during their first five years (primarily representing refugees and asylees, who are eligible to receive benefits during the first five years and are not subject to the public charge rule).

Panel II: Multi-category / continuous factors	
Education	Five categories: less than high school, high school graduate, some college, college graduate, and advanced degree
Family size	Number of family members living in the household

By using these factors, the predictions from our analysis can directly simulate immigration officers' evaluations. If the predicted probability for a given individual exceeds 50%, then it is "more likely than not" that this such individual will become a public charge. An immigration officer faced with this candidate could reasonably conclude that their characteristics predict becoming a public charge and would have grounds to deny the application. On the other hand, if the probability does not exceed 50%, then the immigration officer has no empirical basis on which to deny the application.

We estimate the probability of becoming a public charge using gradient boosting trees, a commonly used machine learning algorithm.[18] This method constructs a small decision tree for each descriptive factor in the sample and splits the entire sample into different units. By iteratively splitting the data and weighing each of these splits based on how well they predict patterns of benefit receipt, this method is able to estimate the likelihood for all individuals in the sample.[19]

A major advantage of our machine learning approach is its flexibility: it can simulate the "totality of the circumstances framework". Officers may weigh the factors in any manner and are not limited to simply "counting up" the positive and negative factors. Some factors may interact, such that each factor alone may not predict becoming public charge, but in combination they are effective predictor. Our method is able to flexibly combine the factors in the same way an officer would, without imposing any particular assumptions on the functional form and allowing for interactions and non-linearities.

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[18] For a helpful overview of this algorithm see: Friedman, Jerome, Trevor Hastie, and Robert Tibshirani. *The Elements of Statistical Learning*. New York: Springer, 2009.
https://web.stanford.edu/~hastie/Papers/ESLII.pdf

[19] We follow standard practices for using gradient boosting trees to estimate probabilities. To determine the number of trees grown and the learning rate for each iteration, we use four-fold cross-validation to search over a grid of parameters, finding the pair of parameters that maximizes the model's fit to the data, which we then use to train the final model. For both cross-validation and training the final model, we take the subsample of permanent residents subject to the public charge rule (who are ineligible to receive benefits in their first five years of permanent residency) and predict their average benefit-months collected when they become eligible in year five as a function of the characteristics described above. We then take the predicted monthly benefit-month receipt rate and compute the probability of exceeding 12 benefit-months during a 36-month period using the binomial cumulative distribution function.

Our predictions show that no lawful permanent resident is "more likely than not" to become a public charge, as defined in the 2019 rule. Figure 5 below shows the distribution of predicted probabilities, which is highly skewed. The overwhelming majority–99%–of LPRs in our sample are predicted to have a less than 5% chance of becoming a public charge. A small number of observations have a probability of becoming a public charge between 5% and 25%, but these are the highest probabilities in our sample. No observations have a probability higher than 50%, indicating that none of the permanent residents in our sample could be empirically judged to be more likely than not to become a public charge.

Figure 5: Predictions of public charge likelihood
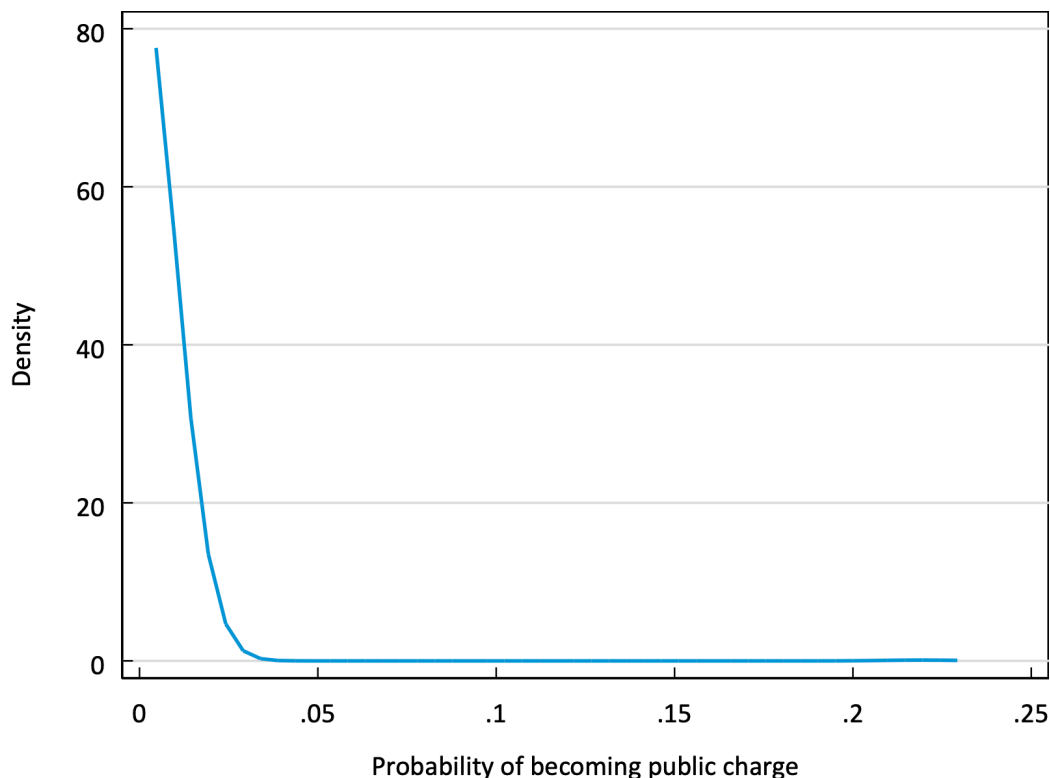
Notes: This figure shows the distribution of predicted probabilities of meeting the DHS definition of a public charge. The line shows the nonparametric density function estimated using a gaussian kernel with bandwidth of 1%. Density is undefined beyond 25% since no LPRs are predicted to have probabilities above this point.

Implications for Policy

The analysis above challenges the notion that any LPRs could meet the grounds for inadmissibility under the 2019 public charge rule. While some LPRs end up receiving government benefits, they do so at lower rates than citizens and the characteristics considered by immigration officials are only weakly predictive of receipt rates. As a result, no LPRs in our sample are "more likely than not" to become a public charge in the future. Furthermore, the vast majority of all LPRs have extremely low predicted probabilities of exceeding the public charge rule threshold, with most below 5 percent.

Nonetheless, during the period in which the 2019 public charge rule had been in place, applicants had to provide extensive documentation for the factors used in the public charge rule despite empirical evidence that these applicants could not have met this threshold. Some may have been denied permanent residency if an immigration officer believed that particular characteristics indicated predicted probabilities above 50 percent, despite the fact that the data do not suggest any characteristics have this predictive power in isolation or combination.

From a broader perspective, our results point to the importance of using empirical evidence to ground policymaking. The sample used here had been collected and released publicly by the Census Bureau prior to the proposal of the public charge rule. There was no barrier to DHS performing an analysis like the one in this article which would have shown that no LPRs would meet the threshold laid out in the rule. Conducting empirical analysis would help DHS ensure that its rules do not adversely impact applicants by denying entry to individuals who do not pose a public charge risk.